

Revised 1/99

Applicant or Patentee: John Clare William Scott and James Donoghue Attorney's
 Serial or Patent No.: _____ Docket No: 148/244
 Filed or Issued: _____
 For: METHOD OF PACKAGING

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS (37 C.F.R. 1.9(f) and 1.27(b)) - INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled _____ described in

- ☒ the specification filed herewith
☐ application serial no. _____, filed _____
☐ patent no. _____, issued _____

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☒ no such person, concern or organization
☐ persons, concerns or organizations listed below*

*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME _____
 ADDRESS _____
☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

FULL NAME _____
 ADDRESS _____
☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

FULL NAME _____
 ADDRESS _____
☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

John Clare William Scott James Donoghue
 NAME OF INVENTOR NAME OF INVENTOR

Signature of Inventor Signature of Inventor

Date Date

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: SCOTT et al.
SERIAL NO.: Not yet assigned
FILING DATE: September 5, 2000
FOR: METHOD OF PACKAGING

BOX PATENT APPLICATION
Assistant Commissioner for Patents
Washington, DC 20231

PRELIMINARY AMENDMENT

Sir:

After the assignment of a serial number and prior to the initial examination of the above-identified patent application, please make the following amendments:

IN THE CLAIMS:

In claim 6 delete "or 5".

In claim 9 delete "any one of Claims 2-8" and insert -- Claim 2 --.

In claim 13 delete "any one of the proceeding claims" and insert -- Claim 12 --.

In claim 15 delete "any one of the proceeding claims" and insert -- Claim 14 --.

In claim 16 delete "any of the proceeding claims" and insert -- Claim 15 --.

In claim 19 delete "17 or".

In claim 22 delete "17 or".

In claim 25 delete "any one of Claims 17 - 19" and insert -- Claim 19 --.

In claim 26 delete "any one of the proceeding claims" and insert -- Claim 25 --.

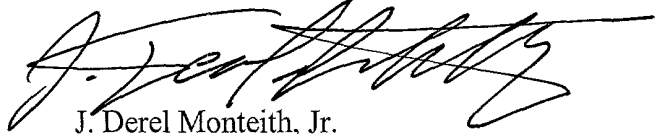
APPLICANT: SCOTT et al.
Page 2

Please delete claims 27 and 28.

REMARKS

It is believed that this application is now in condition for allowance. Such action at an early date is respectfully requested.

Respectfully submitted,



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Our File No. 148/244

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Field of the Invention

Background of the Invention

Methods of vacuum packing food are well known. A basic vacuum packing process for packaging a foodstuff, for example coffee, comprises placing the foodstuff inside a plastic pouch, placing the pouch inside the cavity of a vacuum packer, and removing the air from the cavity by means of the vacuum pump. The pouch is then sealed whilst it remains in the evacuated cavity in order to maintain a vacuum inside the pouch. The shelf life of foodstuffs can be greatly enhanced by using this method of packaging.

It is also known to use gas flushing vacuum packing to pack foodstuffs. Gas flushing vacuum packing involves placing the foodstuff in a container and placing the container in the cavity of a vacuum packer. Again the cavity is evacuated by means of the vacuum pump of the packer. In this case though, before the container is sealed, the cavity of the vacuum packer is filled with an inert gas, for example, helium, argon, nitrogen or carbon dioxide or mixtures thereof. The amount of inert gas supplied to the cavity is generally sufficient to return the pressure inside the cavity to at or around atmospheric pressure, but this can be varied as required. The container is then sealed whilst in the inert gas

atmosphere, thereby providing a sealed container in which the foodstuff is stored in an inert atmosphere. Gas flushing vacuum packing is often used to package fresh meat, for example, and is advantageous in that it can
5 prolong the shelf life of refrigerated foodstuffs.

Whilst the aforementioned methods of packaging are advantageous for packaging solid goods, such as coffee or meat, such methods have not been found suitable for
10 packaging goods comprising a liquid element. By "liquid element" we mean the portion of the goods which are in a liquid state and are separable from and not a component part of any solid element of the goods.

15 When goods having a liquid element are subjected to vacuum packing gases, dissolved in the liquid come out of solution, i.e. they form a gas, due to the reduction in pressure. This is a problem, in that in order to operate properly, and provide an airtight seal, it is important
20 that the vacuum packer is kept clean. When the liquid boils, it tends to spray over the inside of the vacuum packer cavity and reduces the effectiveness of the packaging. Furthermore, the majority of the liquid is removed from the goods to be packaged.

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It is an object of preferred embodiments of the present invention to provide an improved method of packaging goods.

Summary of the Invention

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The present invention provides a method of packaging goods having a liquid element, said liquid element comprising dissolved gases, wherein the liquid element is

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treated prior to said goods being subjected to a vacuum packing process, such that a substantial proportion of said dissolved gases does not escape from said liquid element during said vacuum packing process.

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Preferably, the liquid element is treated by subjecting it to a gas removal process.

Suitably, the gas removal process comprises subjecting
10 the liquid to an evacuation process in a vacuum packer. Suitably, the liquid is placed in a container, which is placed in the cavity of a vacuum packer. The cavity is then evacuated in the conventional manner.

15 As the cavity is evacuated, any dissolved gases in the liquid come out of solution into the gaseous state and escape in the form of bubbles which burst allowing the gas to escape. When substantially all of the dissolved gases have been removed from the liquid the liquid stops
20 bubbling.

Suitably, the gas removal process removes substantially all of the dissolved gases from the liquid.

25 The length of time taken to remove substantially all of the dissolved gases from the liquid will vary depending upon the composition of the liquid, the viscosity of the liquid, the volume of liquid and the exposed surface area of the liquid held in the container, amongst other things.

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Because the escaping gases form bubbles the volume of the liquid increases during the gas removal process whilst the bubbles of gas escape. As the viscosity of the liquid

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increases, the size of the bubbles increases. Therefore, the volume of a viscous liquid will increase more during the gas removal process than would the volume of a less viscous liquid.

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For liquid elements comprising a particularly viscous liquid which comprises a plurality of component liquids, for example a cream based sauce for food, it may be advantageous to subject the component parts of the liquid element to separate gas removal processes. For example, in the case of a cream based white wine sauce the white wine and the cream are advantageously subjected to separate gas removal processes before being combined together for the vacuum packing process.

15

Suitably, the container holding the liquid has a volume of at least twice, preferably at least three times, more preferably at least four times and most preferably at least five times, the volume of the liquid being subjected to the gas removal process.

20

Preferably, the container is shaped such that the exposed surface area of the liquid when held in the container is greater than the depth of liquid. Suitably, the exposed surface area of the liquid is at least twice, preferably at least three times, more preferably at least six times and most preferably at least ten times the depth of the liquid.

25

Generally, the gas removal process requires evacuation of the cavity for a time of the order of seconds, for example for 20-30 seconds. However, it has been found that evacuation for a longer period is not detrimental to the

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nature and quality of the liquid. Evacuation until the liquid stops bubbling (to the naked eye) is considered to be the minimum period required.

5 In order to be certain that substantially all of the dissolved gases have been removed from the liquid, the liquid could be subjected to evacuation for an extended period, which extended period is longer than the minimum period. This extended period may be up to 120%, is
10 suitably up to 130%, is preferably up to 150%, is more preferably up to 160% and is especially up to 200% or more of the minimum period.

Suitably, during the gas removal process, the cavity of
15 the vacuum packer is evacuated to at least a 90% vacuum, preferably to at least a 95% vacuum, more preferably to at least a 99% vacuum and especially to at least a 99.5% vacuum.

20 It has been found that the gas removal process outlined above does not affect the flavour or consistency of the liquid element, and because no heat is applied to the liquid element, it remains uncooked during the gas removal process.

25 An alternative gas removal process, involves cooking the liquid element, for example, by heating to boiling point. However, this process is not preferred if the object is to provide a product comprising fresh, uncooked
30 food. The quality of the sauce will be reduced by cooking before packaging followed by subsequent reheating for consumption.

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As an alternative to a gas removal process the liquid element may be treated by subjecting it to a freezing process prior to the goods being subjected to a vacuum packing process.

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Suitably, if the goods comprise a liquid element and a solid element, only the liquid element is subjected to freezing. However, both the liquid element and the solid element may be subjected to freezing before being subjected to the vacuum packing process.

Because the liquid element is in a solid form during the vacuum packing process, the dissolved gases in the liquid cannot leave solution and form a gas which escapes during the vacuum packing process. Therefore, the disadvantages of vacuum packing a liquid are avoided. The liquid element can be left to melt after packaging.

20 An advantage of treating the liquid element by freezing is that again, this process avoids cooking the liquid prior to packaging and thus avoids repeated cooking processes which impair the quality of the food.

25 Preferably, treatment of the liquid element does not involve cooking the liquid element.

The vacuum packing process of the inventive method may be any conventional vacuum packing process, including a basic vacuum packing process and a gas flushing vacuum packing process. For example, suitable basic vacuum packing and gas flushing vacuum packing processes are described above in the section entitled "Background of the Invention".

The goods packaged in accordance with the present invention may comprise substantially only a liquid element. For example, milk or sauces for food, such as pasta sauces, may be packaged in accordance with the present invention.

Alternatively, goods packaged in accordance with the present invention may comprise a liquid element and a solid element. For example, fresh pasta in a pasta sauce or meat in a sauce may be packaged in accordance with the present invention.

If the goods comprise a solid element and a liquid element, the liquid element is preferably treated before being combined with the solid element of the goods for the vacuum packing process.

In the case of foodstuffs, if the goods comprise a solid element, which solid element comprises a liquid intrinsic within its structure, for example a piece of meat, the solid element is suitably treated before vacuum packing such that the intrinsic liquid within the solid element can escape during cooking. Suitable methods of treating the solid element include perforating the solid element. Suitably, the surface at least of the solid element is perforated. Preferably, the solid element is perforated at a plurality of locations. The perforations may provide a plurality of small holes, through which the liquid can escape as it boils during the cooking process. Suitably, this series of holes is provided by a meat tenderiser as commonly used. Alternatively, any means of piercing the solid element may be used. If the said element is perforated at a plurality of locations, the perforations

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may be applied in a single or a plurality of perforating steps. This method of treating the solid element is particularly appropriate if the method of cooking involves microwave cooking.

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Vacuum packing of goods finds particular advantage in packaging of foodstuffs. However, vacuum packing may find advantage in packaging of any goods which are subject to deterioration during prolonged storage periods.

10

When the liquid element which has been treated is subsequently subjected to a vacuum packing process, the liquid element does not boil. Thus, goods treated in accordance with preferred embodiments of the present invention can be packaged using conventional vacuum packing techniques without the disadvantages of the prior art.

The invention further provides a method of vacuum packing goods having a liquid element, comprising the steps of subjecting the liquid element to a gas removal process, followed by subjecting the goods to a vacuum packing process.

The gas removal process may be any suitable process as hereinbefore described.

The method may further comprise the step of perforating a solid element of said goods, before subjecting said goods to said vacuum packing process.

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The perforating step may comprise piercing the surface at least of said solid element. The perforating step

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preferably comprises piercing the full depth of said solid element.

The perforating step may involve piercing the solid element in a plurality of locations. The solid element may be pierced in a plurality of locations in a single or a plurality of perforating steps.

The vacuum packing step may comprise any suitable vacuum packing process as hereinbefore described.

The present invention yet further provides a packaged foodstuff packaged in accordance with the method of the present invention.

15

The present invention finds particular advantage in packaging of fresh foodstuffs. An advantage of the present invention resides in the fact that fresh, uncooked foodstuffs can be packaged using conventional vacuum packing techniques to provide products which are ready for cooking by any method, including in a conventional oven, in a pressure cooker, by steaming and in a microwave oven. Also, because products of the present inventive method do not have to be cooked before packing, cooking the foods for consumption is the only cooking process to which the food is subjected. Therefore, the quality of the food product is improved because the food need only be subjected to a single cooking process rather than a cooking and separate reheating process.

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Furthermore, if the liquid element has been subjected to a gas removal process as described above, when the product is cooked for consumption the liquid element does

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not boil as vigorously. This is particularly advantageous when using microwave cookery techniques. Also, this advantage is particularly evident for more viscous liquids, such as cream based sauces for food.

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The present invention finds particular advantage in the provision of refrigerated foodstuffs, in particular for fresh, uncooked ready meals, having an extended shelf life.

10 Description of Preferred Embodiments of the Invention

A sauce for meat is prepared by mixing, white wine, cream, cornflour and other flavourings. The sauce is placed in a container, which container has a volume of at least five times the volume of the sauce.

The container is placed in the cavity of a vacuum packer and the cavity is sealed. The vacuum pump is then turned on and the cavity is evacuated to a 99.5% vacuum. As the cavity is evacuated the sauce bubbles as the dissolved gases in the sauce come out of solution and form a gas, which bubbles burst so that the gases escape from the liquid. The evacuation process is carried out for about 40 seconds, which is until about 10 seconds after the liquid has stopped bubbling.

The container and the liquid is then removed from the cavity of the vacuum packer.

A proportion of the thus degased sauce is placed into a microwaveable plastic tray. A portion of fresh, uncooked chicken is then placed on top of the sauce. A further

portion of the degased sauce is placed on top of the fresh, uncooked chicken.

The microwaveable plastic tray is then placed in the cavity
5 of a vacuum packer. The cavity is evacuated, again to a
99.5% vacuum. A 70:30 wt% mixture of nitrogen:carbon
dioxide gas is then supplied to the cavity of the vacuum
packer to provide an inert gas atmosphere in the cavity.
The gas mixture is supplied by BOC, England. Sufficient
10 gas is supplied to produce a pressure of about atmospheric
pressure in the cavity. The container is then sealed using
a plastic film, whilst it remains in the cavity in the
inert gas atmosphere. The container is sealed such that an
air tight seal is created.

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The thus packaged food is stored in a refrigerator
until required for consumption. To cook the food, the
package is removed from the refrigerator. The film is then
pierced and the package is placed in a microwave oven for
20 cooking. The cooked food may be removed from the container
for serving.

Alternatively, the microwaveable plastic tray and the
plastic film in which the food is packaged may be replaced
25 by an oven proof container and film. The packaged food may
then be cooked in a conventional oven.

Alternatively, the packaged food may be removed
completely from the container before cooking.

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Alternatively, the chicken may be perforated before
placing in the microwaveable plastic tray with the sauce
for vacuum packing.

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The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this
5 specification, and the contents of all such papers and documents are incorporated herein by reference.

All of the features disclosed in this specification (including any accompanying claims, abstract and drawings),
10 and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

15 Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each
20 feature disclosed is one example only of a generic series of equivalent or similar features.

The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any
25 novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

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CLAIMS

1. A method of packaging goods having a liquid element,
said liquid element comprising dissolved gases, wherein
5 the liquid element is treated prior to said goods being
subjected to a vacuum packing process, such that a
substantial proportion of said dissolved gases does not
escape from said liquid element during said vacuum
packing process.
- 10 2. A method in accordance with Claim 1, wherein the liquid
element is treated by subjecting it to a gas removal
process.
- 15 3. A method in accordance with Claim 2, wherein the said
gas removal process comprises subjecting said liquid
element to an evacuation process in a vacuum packer.
- 20 4. A method in accordance with Claim 3, wherein the said
evacuation process involves placing said liquid element
in a container which is then placed in a cavity of the
vacuum packer, said cavity subsequently being evacuated
by means of a vacuum pump.
- 25 5. A method in accordance with Claim 4, wherein said
container has a volume of at least twice the volume of
said liquid element.
- 30 6. A method in accordance with Claims 4 or 5 wherein
liquid element when held in said container has an
exposed surface area which is greater than the depth of
the liquid in said container.

7. A method in accordance with Claim 2, wherein said gas removal process involves cooking the liquid element.
8. A method in accordance with Claim 7, wherein cooking
5 the liquid element involves heating it at boiling point.
9. A method in accordance with any one of Claims 2-8 wherein the said gas removal process removes
10 substantially all of the dissolved gases from the liquid element.
10. A method as claimed in Claim 1, wherein the liquid element is treated by subjecting it to a freezing
15 process.
11. A method according to Claim 10, wherein if said goods comprise a liquid element and a solid element, only said liquid element is subjected to said freezing
20 process.
12. A method in accordance with Claim 11, wherein if said goods comprise a liquid element and a solid element, both said liquid element and said solid element are
25 subjected to said freezing process.
13. A method in accordance with any one of the proceeding claims, wherein said vacuum packing process is any conventional vacuum packing process.
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14. A method in accordance with Claim 13, wherein said conventional packing process is a basic vacuum packing process or a gas flushing vacuum packing process.

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15. A method in accordance with any one of the proceeding claims, wherein said goods comprises foodstuffs.
- 5 16. A method with in accordance with any one of the proceeding claims wherein said goods comprises a solid element and a liquid element.
- 10 17. A method according to Claim 16, wherein said solid element is perforated before said goods are subjected to said vacuum packing process.
- 15 18. A method according to Claim 17 wherein the surface at least of said solid element is perforated.
- 20 19. A method according to Claim 17 or 18 wherein said solid element is perforated in a plurality of locations.
- 20 20. A method of vacuum packing goods having a liquid element, comprising the steps of subjecting said liquid element to a gas removal process, followed by subjecting the goods to a vacuum packing process.
- 25 21. A method according to Claim 17, wherein said gas removal process involves subjecting said liquid element to a vacuum.
- 30 22. A method according to Claim 17 or 18, wherein said method further comprises the step of perforating a solid element of said goods, before submitting said goods to said vacuum packing process.

23. A method according to Claim 19, wherein said perforating step comprises piercing the surface at least of said solid element.
- 5 24. A method according to Claim 20, wherein said solid element is pierced in a plurality of locations.
25. A method according to any one of Claims 17-19, wherein said vacuum packing process is a gas flushing vacuum packing process.
- 10 26. A packaged foodstuff, packaged in accordance with any one of the proceeding claims.
- 15 27. A method as herein before described.
28. A packaged foodstuff as herein before described.

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ABSTRACTMETHOD OF PACKAGING

5 The present invention provides a method of packaging
goods having a liquid element, said liquid element
comprising dissolved gases, wherein the liquid element is
treated prior to the goods being subjected to a vacuum
packing process, such that a substantial volume of the
10 dissolved gases do not escape from said liquid element
during said vacuum packing process. Suitable methods of
treatment of the liquid element include subjecting the
liquid element to a gas removal process and subjecting the
liquid element to a freezing process.

15

Declaration and Power of Attorney for Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole/joint inventor of the subject matter which is claimed and for which a patent is sought on the design for

METHOD OF PACKAGING

the specification of which

☒ is attached hereto.

☐ was filed on _____ as Application Serial No. _____
and was amended on _____.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

If this application is a continuation-in-part application, I acknowledge the duty to disclose to the Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56, which became available between the filing date of the prior application and the national or PCT international filing date of this continuation-in-part application.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority Claimed

_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below, and insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing of this application:

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(Application Serial No.) (Filing Date) (Status - Patented, Pending, Abandoned)

(Application Serial No.) (Filing Date) (Status - Patented, Pending, Abandoned)

I hereby declare that all statements made hereby of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agents(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: W. THAD ADAMS, III, REG. NO. 29,037, JEFFREY J. SCHWARTZ, REG. NO. 37,532, J. DEREL MONTEITH, JR., REG. NO. 45,464 and T. PEIGE WISE, REG. NO. 44,407; addressed to:

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I request that all correspondence, telephone calls and/or facsimiles be directed to W. Thad Adams, III, Jeffrey J. Schwartz, J. Derel Monteith, Jr. or T. Peige Wise at their above-stated address.

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Full name of sole or first inventor	Inventor's signature	Date	Citizenship

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Full name of third inventor	Inventor's signature	Date	Citizenship

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